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ABSTRACT

This speech presents a study that identified factors predominately related to the efficient allocation of resources in Florida's public school districts. Information was collected from 67 school districts concerning 27 variables that were found in an optimum effective school district. The variables were analyzed using the principal component procedure to identify factors for consideration when allocating educational resources to school districts. The results showed that teacher commitment, student transportation, school district financing, and pupil population in educational programs were the four main areas of school district resource allocations. (Author)

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AN INVESTIGATION IN EDUCATIONAL RESOURCE ALLOCATION IN SCHOOL DISTRICTS

by

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AN INVESTIGATION IN EDUCATIONAL RESOURCE ALLOCATIONS IN SCHOOL DISTRICTS

Background and Objectives

The purpose of this study was to identify factors (components) predominately related to the efficient allocation of resources in Florida's public school districts. Since 1947, those districts have been coterminous with county lines. In that year the state reduced the six hundred and fifty school districts to the present sixty-seven county units. Accordingly, boundaries of existing governmental agencies determined the size of each district. Factors believed to be associated with effective and efficient operation were given little or no consideration in this change.

In viewing Florida school districts on the basis of size, it was found that forty-one of the counties had less than 10,000 students and twenty-nine had less than 5,000. It seemed evident that because of a lack of resources, smaller counties were confronted with a variety of educational, administrative, and financial problems. Although some of these difficulties have been eased by formal and informal agreements among adjacent school systems, most restrictions resulting from limited enrollments and resources have not presently been overcome. Upon a review of the pertinent research regarding the optimum effective school district, twenty-seven variables were selected for inclusion in the study. Measurements on each of these variables in the county districts of the State of Florida were collected.

Method

A principal component analysis was performed on the correlation matrix among the twenty-seven measures (Table 1) collected *(1) Components were retained corresponding to the eigenvalues of the matrix greater than one. The raw components were orthogonally rotated according to the normal varimax criterion. Rotated pattern coefficients absolutely greater than .5 were utilized for interpretation purposes.

Upon determination of the component pattern, counties with less than 5,000 pupils in average daily membership were defined as "small." From these, eight were selected and hypothetically reorganized into three regions, each of which was compared to a model county selected on the basis of comparable pupil population and ability to support an educational program. Those comparisons were made on the bases of transportation and administrative costs as well as classes taught by out-of-field teachers. Course offerings together and graduating class size were also used for comparative purposes.

Results

The rotated (varimax) pattern matrix for the principal components solution is presented in Table II. Four components were retained. The first was named Pupil Data since it exhibited high positive coefficients on:

1.	Number of High School Graduates	.983
6.	Instructors Full Time	.982
7.	Teachers Full Time	.981
9.	Average Population per Square Mile	.697
10.	County Assessment Level	.910
13.	Local Effort for Education (MFP)	.972

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(1) Harvard University Computing Center.

14.	Total Current Expenses	.971
22.	Capital Outlay	.876
26.	Enrollment	.979
27.	Enrollment Change	.962

The second component was termed Transportation since it was dominated by variables related to bus transportation although instructional salary was highly correlated with this dimension.

21.	Average Annual Instructional Salary	.879
23.	Percent of Transported Students	.977
24.	Bus miles Traveled on Unpaved Roads	.978
25.	Bus miles Traveled on the Morning Trip	.976

The third component exhibited high positive correlations on:

11.	Non-exempt Valuation for Average Daily Attendance	.538
15.	Current Expenses per Pupil	.933
16.	Instruction Expenses per Pupil	.865
17.	Plant Expenses per Pupil	.778
18.	Maintenance Expenses per Pupil	.715

and was named Per Pupil Expenditures. The fourth component (variance=2.275) was considered residual and was not interpreted.

The per pupil per mile costs of transportation are summarized in Table III. It can be observed that in smaller counties with low population that relative transportation costs were high. A similar pattern was also noted for administrative costs per pupil (Table IV). The larger counties also evidenced a much lower incidence of out-of-field classes taught (Table V), as well as larger graduating classes and more course offerings (Table VI).

Conclusion

A study of the collected data revealed that school districts in Florida varied greatly in the educational opportunities provided for students. It appeared that small school districts were incapable of providing a quality educational program that a reorganized school district of moderate size could provide because of a more effective distribution of both facilities and personnel, and an availability of resources. Therefore, the following conclusions, based upon the comparative analysis of these data seemed justified.

1. In all instances, the small districts were unable to operate efficiently. It was found that a better educational program could be provided for less money by increasing pupil population through the reorganization of small school districts. Investigation of school districts having less than 5,000 pupils showed a higher current expense per pupil than larger school districts. There was an inverse relationship between pupil population and current expenses per pupil (Chart I).

2. In smaller counties with low pupil population, transportation costs per pupil were high. In some instances the increase in transportation costs resulted from dual systems. This suggests that uneconomical duplication of bus routes should be eliminated for more efficient utilization of current equipment and finances.

3. Small counties have a greater administrative cost per pupil than large counties. This suggested that a more efficient distribution of professional administrative personnel could result from reorganization of small counties into larger regional school districts.

4. Small counties have difficulties attracting and holding qualified personnel. This resulted in a higher percentage of classes being taught

by teachers out-of-field in smaller counties.

5. In all instances studied, small counties provided a narrower educational program than large or reorganized units. Through hypothetical reorganization of small counties into large regional districts, the educational offerings (depth and breadth of course offerings) and services for students increased.

TABLE I

CORRELATION MATRIX

	1	2	3	4	5	6	7	8
1. High school graduates		292	248	-368	181	997	997	431
2. Percent enter college			097	261	131	301	299	179
3. ADM percent				-122	218	238	241	-131
4. Instr. below Rank III					-296	-369	-371	-238
5. Instr. Rank II & above						178	175	051
6. Instr. full time							999	460
7. Teachers full time								459
8. Land area (sq. miles)								
9. Avg. Pop. (sq. mile)								
10. County assess. levels								
11. Non-ex. value ADA								
12. Personal income per pupil								
13. Local effort M.F.P.								
14. Total current expenses								
15. Current ex.per pupil								
16. Instr. ex. per pupil								
17. Plant ex. per pupil								
18. Main ex. per pupil								
19. Aux. ser. per pupil								
20. Fixed c. per pupil								
21. Avg. annual salary								
22. Capital outlay								
23. Transported percent								
24. Bus miles unpaved								
25. Bus miles, morning								
26. Enrolled 64-65								
27. Change 54-65								

TABLE I, Continued

	9	10	11	12	13	14	15	16
1.	698	919	230	438	992	988	026	236
2.	264	295	235	214	285	296	-198	004
3.	228	183	-241	-292	222	223	-185	-137
4.	-286	-326	-320	-273	-356	-355	-134	-345
5.	184	216	326	068	191	185	231	321
6.	672	936	239	443	994	993	032	239
7.	670	928	233	440	993	990	021	228
8.	013	528	351	390	471	474	027	168
9.		547	181	385	654	643	049	244
10.			337	438	952	958	162	354
11.				399	266	263	352	460
12.					447	437	280	380
13.						996	078	282
14.							079	283
15.								897
16.								
17.								
18.								
19.								
20.								
21.								
22.								
23.								
24.								
25.								
26.								
27.								

TABLE I, Continued

	17	18	19	20	21	22	23	24
1.	343	-047	-486	078	620	881	-587	-402
2.	085	-111	-506	-050	444	255	-347	-294
3.	-212	-227	063	-316	-002	178	107	335
4.	-250	025	348	-116	-516	-388	274	348
5.	272	108	-122	277	309	123	-037	-173
6.	351	-043	-487	081	628	882	-586	-405
7.	343	-046	-490	075	621	883	-587	-406
8.	205	000	-372	099	475	410	-418	-308
9.	305	-069	-397	083	524	571	-433	-350
10.	413	000	-402	166	665	799	-530	-355
11.	502	270	-310	506	558	189	-254	-549
12.	553	226	-363	306	462	453	-609	-528
13.	377	-029	-464	115	643	856	-583	-397
14.	374	-021	-459	109	646	855	-571	-385
15.	697	623	470	557	230	015	112	-021
16.	663	480	159	465	522	191	-098	-176
17.		444	-048	633	464	313	-399	-517
18.			144	622	043	010	-044	-117
19.				-065	-556	-452	739	674
20.					253	068	-157	-366
21.						553	-493	-544
22.							-544	-415
23.								625
24.								
25.								
26.								
27.								

Table I, Continued

	25	26	27
1.	860	996	973
2.	378	291	309
3.	292	237	188
4.	-397	-369	-382
5.	080	163	175
6.	860	997	976
7.	865	998	975
8.	411	459	449
9.	690	657	655
10.	703	918	913
11.	119	223	259
12.	406	436	466
13.	814	988	966
14.	813	985	969
15.	-162	003	051
16.	051	206	254
17.	184	332	383
18.	-112	-050	-019
19.	-533	-494	-493
20.	-086	065	094
21.	578	609	658
22.	860	889	926
23.	-513	-588	-593
24.	-395	-409	-443
25.		873	872
26.			975
27.			

TABLE II

DERIVED COMPONENTS (NORMAL VARIMAX)

		I	II	III	IV
1.	High school graduates	.983	.080	.060	.096
2.	Percent enter college	.269	-.331	-.118	-.408
3.	ADM percent	.305	-.236	-.211	.638
4.	Instr. below Rank III	-.359	.308	-.235	.184
5.	Instr. Rank II & above	.192	-.078	.393	.086
6.	Instr. full time	.982	-.080	.064	-.112
7.	Teachers full time	.981	-.080	.055	-.112
8.	Land area (sq. miles)	.394	-.036	.052	-.533
9.	Avg. Pop.(sq. mile)	.697	-.102	.105	.015
10.	County assess. levels	.910	-.076	.185	-.139
11.	Non-Ex. value ADA	.142	-.148	.538	-.530
12.	Personal income per pupil	.400	.216	.329	-.577
13.	Local effort M.F.P.	.972	-.076	.107	-.111
14.	Total current expenses	.971	-.079	.106	-.109
15.	Current ex. per pupil	.005	.179	.933	.156
16.	Instr. ex. per pupil	.208	.046	.865	.015
17.	Plant ex. per pupil	.303	.070	.778	-.229
18.	Main ex. per pupil	-.120	.046	.715	-.058
19.	Aux. ser. per pupil	-.423	.332	.250	.655
20.	Fixed c. per pupil	-.015	-.002	.746	-.279
21.	Avg. annual salary	.324	.879	.141	-.191
22.	Capital outlay	.876	.160	.067	-.149
23.	Transported percent	.009	.977	.086	-.039
24.	Bus miles unpaved	.007	.978	.081	-.029
25.	Bus miles, morning	.027	.976	.085	-.048
26.	Enrolled 64-65	.979	-.079	.037	-.116
27.	Change 54-65	.962	-.077	.088	-.149
	Eigenvalues	10.838	4.629	3.350	1.699
	Variance	9.876	4.209	4.156	2.275

TABLE III

TRANSPORTATION COSTS PER PUPIL SUMMARIZED

	Total Net Cost	Pupils Transp.	Per Pupil Cost Per Mile
A	167,000	2456	.053
B	91,000	2315	.045
C	92,000	2104	.044
Regional 1	350,000	6875	
X County	140,000	6742	.016
D	41,000	705	.156
F	30,000	535	.151
E	78,000	1221	.090
Region 11	149,500	2461	
Y County	137,911	2376	.078
G	37,006	588	.231
H	37,174	374	.351
Region 111	74,180	962	
Z County	120,913	2313	.082

TABLE IV

ADMINISTRATIVE PER PUPIL COSTS SUMMARIZED

	Administrative Cost	Current Expenditures
A	14.85	413.39
B	16.29	448.93
C	9.56	400.77
Region 1	13.76	420.36
X County	6.02	333.27
D	31.85	455.71
F	43.07	675.93
E	19.14	474.13
Region 11	26.23	498.69
Y County	10.06	386.80
G	24.02	421.50
H	33.47	562.17
Region 111	29.04	503.28
Z County	18.38	476.87

TABLE V

NUMBER OF CLASSES AND PERCENT OF CLASSES
TAUGHT BY TEACHERS OUT-OF-FIELD

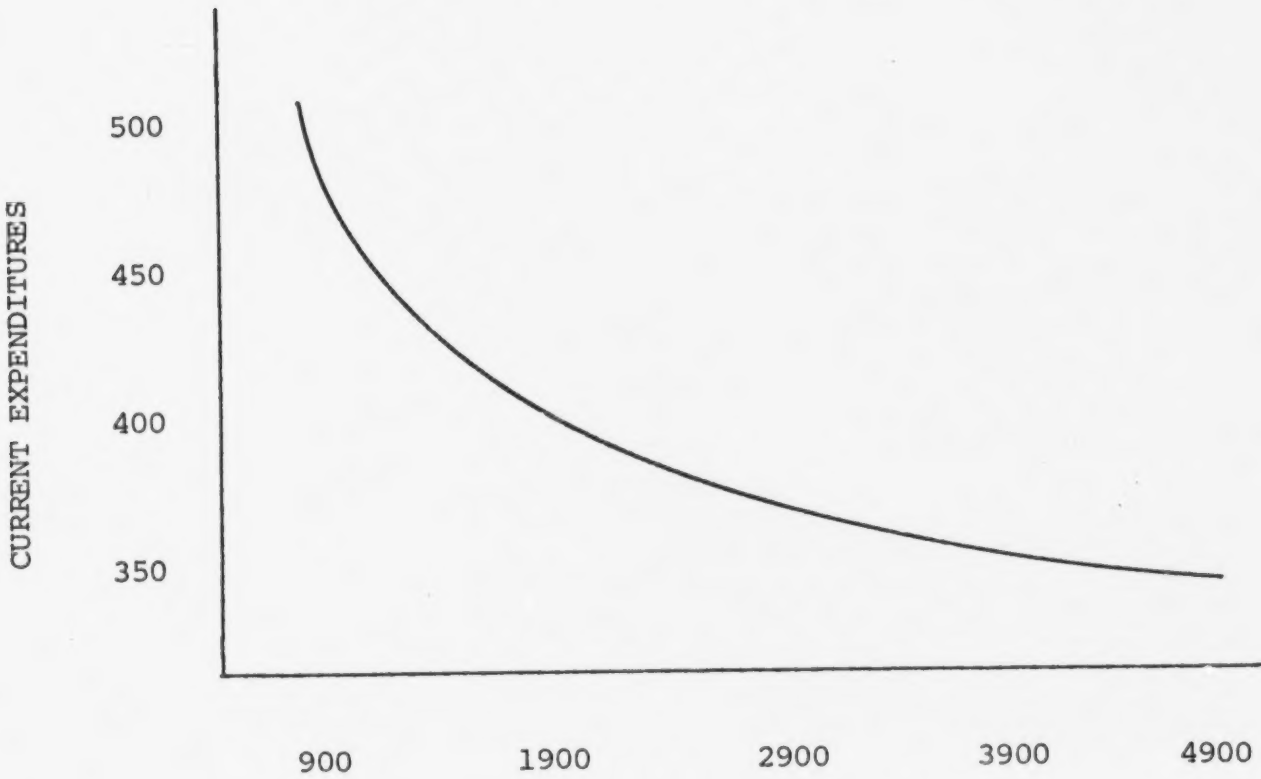
	Total Classes	Classes out-of-field	Percent taught out-of-field
A	445	120	26.9
B	505	105	20.7
C	313	57	18.2
Region 1	1263	282	22.3
X County	940	72	7.6
D	209	52	24.8
F	207	61	29.4
E	431	74	17.1
Region 11	847	187	22.0
Y County	496	84	16.9
G	311	55	17.6
H	119	45	37.8
Region 111	430	100	23.2
Z County	445	95	21.3

TABLE VI

COURSE OFFERINGS AND SIZE OF GRADUATING CLASSES SUMMARIZED

	Courses		Average Graduating Class Size
	Breadth	Depth	
A	12	112	56.5
B	11	119	59.0
C	11	110	45.0
Region 1	12	167	53.1
X County	12	143	77.5
D	10	72	44.0
F	11	108	14.3
E	11	121	32.0
Region 11	12	168	29.1
Y County	13	156	55.8
G	13	102	41.3
H	12	72	22.5
Region 111	13	126	33.4
Z County	12	122	87.5

CHART I



-- Size-cost relationship in the State of Florida for counties with less than 5,000 students.

15

BIBLIOGRAPHY

American Association of School Administrators, School Administration in Newly Reorganized Districts. Washington, D. C.: The Association, 1965.

Campbell, Roald F.: Cunningham, Luvern L.: and McPhree, Roderick F. The Organization and Control of American Schools. Columbus, Ohio: Charles E. Merrill Books, Inc., 1965.

Committee for the White House Conference on Education. A Report to the President. Washington, D. C.: U. S. Government Printing Office, 1956.

Commonwealth of Pennsylvania. A Guide for the 1966 Establishment of School Districts. Harrisburg, Pa.: Department of Public Instruction, 1966.

Conant, James B. The American High School Today. New York: McGraw-Hill, 1959.

Dawson, Howard A., and Ellena, William J. The Status of Schools, School Districts, and School Reorganization. Washington, D.C.: Department of Education, NEA, 1954.

Development of Counties in Florida: 1820 to 1936. Assembled by the Historical Records and State Archives Surveys, Florida Works Progress Administration, 1936. (Man).

George Peabody College for Teachers, Division of Surveys and Field Services. Organization of School Systems in Georgia. Nashville, Tennessee: By the College Press, 1966.

Mort, Paul R. Research Problems in School Finance. National Survey of School Finance, U. S. Department of the Interior, Office of Education Bulletin No. 2, Washington, D.C.: GPO, 1933.

National Commission of School District Reorganization. A Key to Better Education. Washington, D.C.: NEA, 1947.

Vance, Rupert B., and others. High Schools in the South: A Fact Book. Nashville, Tenn.: George Peabody College for Teachers Press, 1965.